WP 2:
Nautical Operations and Transport

MarSafe North
Maritime Safety Management in the High North

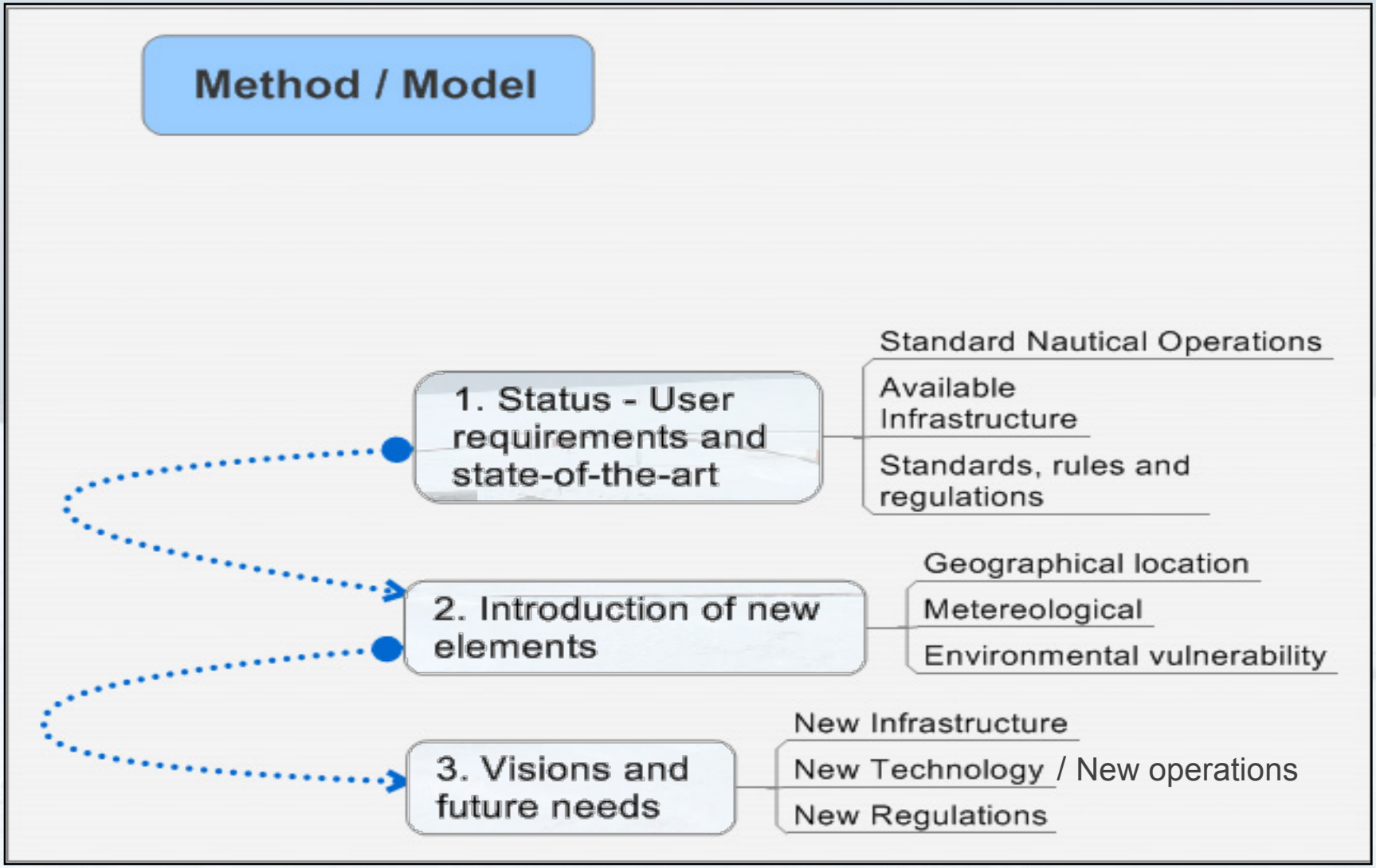
Tony Haugen
Kongsberg Seatex

WP 2 - Objectives

- Give an overview over the main current and possible future maritime activities in the Arctic and the requirements for these with focus on ship handling, positioning and navigation.

- What is needed in order to accomplish the operations as safe and effective as in The North Sea. Do we need:
  - New infrastructure?
  - New technology?
  - New ways of operating?
  - New regulations and carriage requirements?

WP 2 - Work Structure



Status, Arctic infrastructure

Vast areas of the Arctic have insufficient infrastructure to support safe and efficient marine shipping and respond to marine incidents in the Arctic. This includes such critical infrastructure components as:

- the accuracy and availability of timely information needed for safe navigation, positioning and critical operations;
- availability of search and rescue assets,
- pollution response assets and supporting shoreside infrastructure to respond appropriately to marine incidents;
- port reception facilities for ship-generated waste; and
- availability of deepwater ports,
- places of refuge and salvage resources for vessels in distress.

Status, maritime activity

- Fishery
- Passenger vessels and cruise traffic
- Transport
  - New transport corridors
- Other nautical operations
  - Offshore loading operations/cargo transfer
  - Oil/gas exploration / support / DP (supply, stand-by, AHMP etc.)
  - Seismic Survey / Seabed mapping

Visions and Future Needs
Challenges

- Ship handling in ice / DP in ice
- Positioning / Critical operations – availability and robustness of DGNSS corrections
- Communications
- Accurate nautical charts
- Accurate weather and ice forecasts / warnings
- Integrated Environmental Monitoring
- Manual work outside
- Iceing on hulls, quays and other objects and structures

→ New technology, new infrastructure, new operational consepts, new regulations,

Conclusions vs Drivers/Keys

- Improve GNSS service by providing stable differential corrections
- Improve communications
- Ship hull and constructions must be designed for operation in ice and in a cold climate
- Requirements to equipment and personnel
  - Updated regulations and requirements for equipment / vessels and training of personnel

Further Work

- We need a greater understanding of the Arctic GNSS conditions
  - Ionosphere/troposphere models
  - Scintillation effects
  - The effects of Galileo
- Alternative correction sources
  - New infrastructure
  - Mobile/dynamic infrastructure
- R&D on hulls/structures meant to be operated in an Arctic environment
  - Iceing
  - Operation with sea ice